RIVERSIDE ESTATES (PWS 6060059)
SOURCE WATER ASSESSMENT FINAL REPORT

October 17, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Riverside Estates, Blackfoot, Idaho* describes the public drinking water system (PWS), the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Riverside Estates (PWS #6060059) is a community water system. The drinking water system consists of two well sources (North Well and South Well) that serve approximately 75 persons. The water system is located on Highway 39 about 3 miles west of Blackfoot.

The potential contaminant sources within the delineation capture zone include former underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, a wastewater land application (WLAP) site, dairies, and gravel mines. Also found were sites regulated under the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Release Inventory (TRI). Other sources identified that may contribute to the overall vulnerability of the water source were businesses within the delineated areas that may be considered potential contaminants sources, the extensive irrigation canal systems, recharge points (active, proposed, and possible recharge sites on the Snake River Plain), and deep injection wells. Injection wells regulated under the Idaho Department of Water Resources generally are for the disposal of stormwater runoff or agricultural field drainage. Additionally, Interstate 15, Highway 20, Highway 26, and Highway 39 are transportation corridors that cross the delineations. If an accidental spill occurred from these corridors, inorganic chemical (IOC) contaminants, volatile organic chemical (VOC) contaminants, synthetic organic chemical (SOC) contaminants, or microbial contaminants could be added to the aquifer system. A complete list of the potential contaminant sources is provided with this assessment (Appendix A).

For the assessment, a review of laboratory tests was conducted using the Idaho Drinking Water Information Management System (DWIMS) and the State Drinking Water Information System (SDWIS). Total coliform bacteria were detected in the distribution system in November 1993, June 1994, December 1996, October 1999, September 2000, and May 2002. The IOCs, arsenic, barium, fluoride, selenium, and nitrate have been detected in the drinking water, but at concentrations below the maximum contaminant levels (MCLs) for each chemical. Arsenic was detected, in August 1995, at a concentration of 0.007 milligrams per liter (mg/L), which, at this time, is below the MCL of 0.01 mg/L. In October 2001, the EPA lowered the arsenic MCL from 0.05 mg/L to 0.01 mg/L, giving systems until 2006 to comply with the new standard. The SOC, Di(2ethylhexyl)-phthalate, was detected in December 1998 and March 1999 at concentrations of 0.0049 mg/L and 0.0032 mg/L, respectively. The MCL for Di(2ethylhexyl)-phthalate is 0.006 mg/L. Di(2ethylhexyl)-phthalate is most commonly used as a plasticizer for polyvinylcholoride (PVC) and other polymers including rubber, cellulose and styrene. No VOC contaminants have been detected in the drinking water.

The capture zone for the wells intersects a priority area for the SOC, atrazine. The MCL for atrazine is 0.003 mg/L. The organic priority area is where greater than 25 % of the wells in the area show levels greater than 1% of the primary standard or other health standards. Atrazine is a widely used herbicide for control of broadleaf and grassy weeds.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate.

The final susceptibility rankings for the wells were automatically rated high for IOCs and microbials due to the presence of an animal pasture within 50 feet of the wells and for SOCs due to the presence of Di(2ethylhexyl)-phthalate in the drinking water. The wells also rated high for VOCs contaminants. Hydrologic sensitivity and system construction scores rated high for the wells. Potential contaminant inventory and land use scores rated high for IOCs, VOCs, SOCs, and moderate for microbial contaminants.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Riverside Estates, drinking water protection activities should continue efforts aimed at keeping the distribution system free of microbial contaminants that may affect the drinking water quality. The water system should continue using disinfection practices to treat the water source. In addition, continued efforts and monitoring should be undertaken to protect the water system from the organic contaminant, Di(2ethylhexyl)-phthalate. Furthermore, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). The wells should maintain sanitary standards regarding wellhead protection. Also, any new sources that could be considered potential contaminant sources that reside within the wells' zones of contribution should also be investigated and monitored to evaluate the threat the contaminant may pose in the future. No potential contaminants (pesticides, paint, fuel, cleaning supplies, etc.) should be stored or applied within 50 feet of the wells. Land uses within most of the source water assessment area are outside the direct jurisdiction of Riverside Estates. Therefore partnerships with state and local agencies, industrial and commercial groups should be established to ensure future land uses are protective of ground water quality. Educating the public about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods, proper lawn and garden care, and the importance of water conservation to name but a few. There are multiple resources available to help water systems implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Bingham County Soil and Water Conservation District. As major transportation corridors intersect the delineation (such as Interstate 15, Highway 20, Highway 26, and Highway 39), the Idaho Department of Transportation should be involved in protection efforts.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR RIVERSIDE ESTATES, POCATELLO, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are contained in this report. The list of significant potential contaminant source categories and their rankings used to develop this assessment is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the public water system (PWS).**

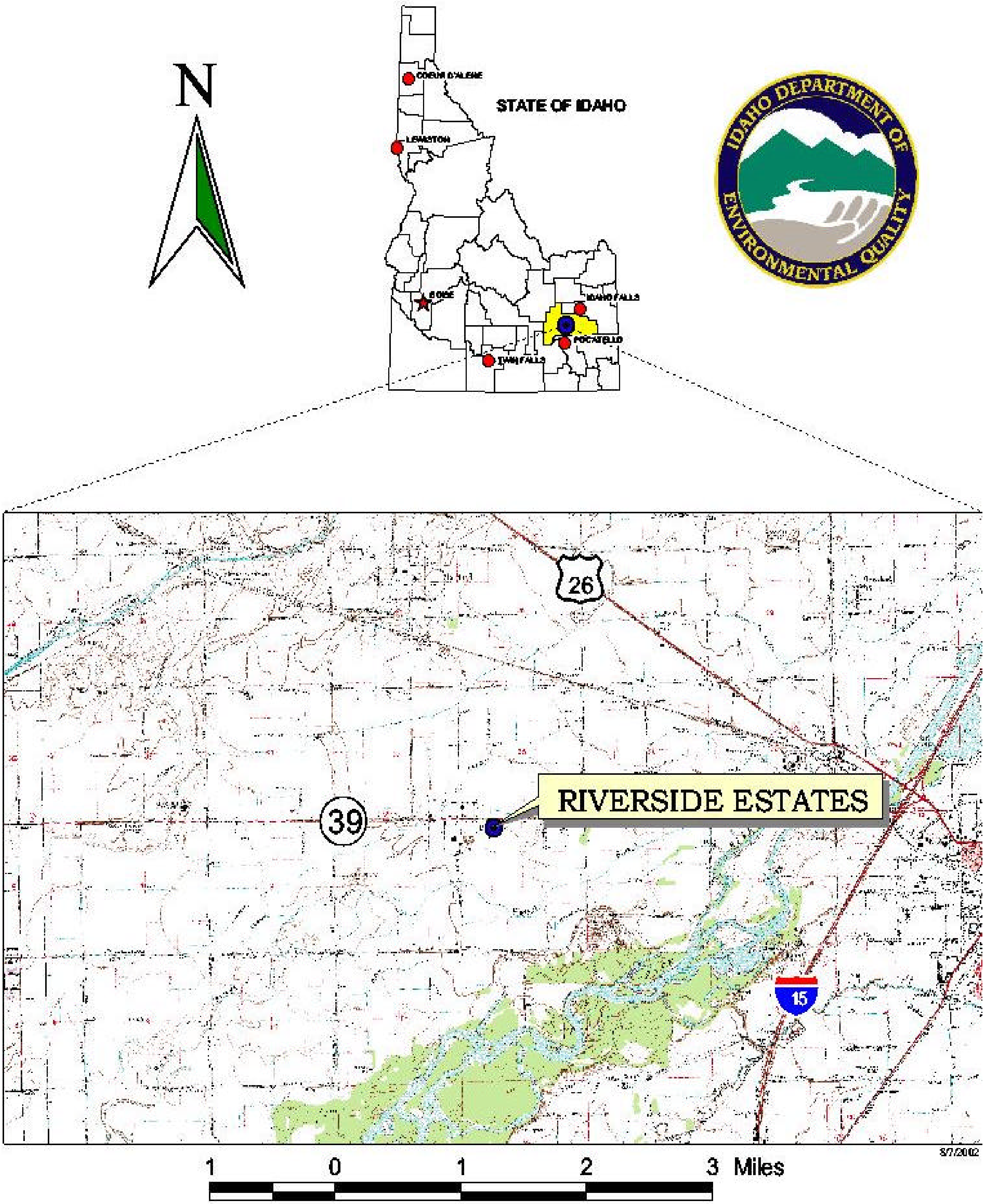
The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Riverside Estates (PWS #6060059) is a community water system. The drinking water system consists of two well sources that serve approximately 75 persons. The water system is located on Highway 39 about 3 miles west of Blackfoot (Figure 1).

Figure 1 - Geographic Location of Riverside Estates (PWS 6060059) Well, Bingham County



Total coliform bacteria have been detected at various locations in the distribution system. The inorganic chemicals (IOCs), arsenic, barium, fluoride, selenium, and nitrate represent the main water chemistry components affecting the system at this time. In addition, the synthetic organic chemical (SOC) contaminant, Di(2ethylhexyl)-phthalate, has been detected in the drinking water. No volatile organic chemicals (VOCs) have been detected in the drinking water.

Defining the Zones of Contribution--Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a pumping well) for water in the aquifer. Washington Group International (WGI) was contracted by DEQ to define the public water system's zones of contribution. WGI used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone II) and 10-year (Zone III) Time-of-Travel (TOT) for water associated with the East Margin Area of the Eastern Snake River Plain (ESRP) hydrologic province in the vicinity of the Riverside Estates. The computer model used site specific data, assimilated by WGI from a variety of sources including well logs (when available), operator records, and hydrogeologic reports. A summary of the hydrogeologic information from the WGI report is provided below.

Hydrogeologic Conceptual Model

The East Margin Area encompasses 821 square miles, representing approximately 8 percent of the total area of the ESRP hydrologic province. The majority of the East Margin Area is within Bingham County, with small areas occurring in Bannock, Bonneville, and Power counties.

The regional ESRP aquifer is the most significant aquifer in the East Margin Area and consists primarily of basalt of the Quaternary-aged Snake River Group. However, additional water-bearing units are used for water supply along the margin of the ESRP. In order of decreasing age, the most significant aquifers in the Michaud Flats area are bedded rhyolite (volcanic rock) of the Tertiary-aged Starlight Formation and Quaternary-aged gravels of a low relief plain formed by running water (pediment), basalt of the Big Hole Formation, and stream deposits of the Sunbeam Formation (see Jacobson, 1982, p. 7, and Corbett, et al., 1980, pp. 6-10). A few shallow domestic wells in the central Michaud Flats area also are completed in Michaud Gravel, which is the shallow water-table aquifer. The American Falls Lake Beds Formation (AFLB) confines the deeper aquifers and averages 80 feet in thickness in the central Michaud Flats area (Jacobson, 1984, p. 6). The AFLB pinches out in the eastern Michaud Flats area near the Portneuf River, effectively combining the shallow and deep stream deposits into a single water table aquifer (Bechtel, 1994, p. 2-2). Other aquifers in the East Margin Area include fractured quartzite that has been developed near Blackfoot, stream deposits near the cities of Firth and Basalt.

PWS wells in the East Margin Area of the ESRP province produce water from five different aquifers: the Regional Eastern Snake River Plain aquifer, three alluvial (or stream deposited) aquifers (Eastern Michaud Flats, Firth/Basalt, and Gibson Terrace/Pocatello Bench) and a quartzite aquifer (Blackfoot).

Regional Eastern River Plain Aquifer

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are primarily filled with highly fractured layered Quaternary-aged basalt flows of the Snake River Group, which are between (intercalated) layers of rocks formed by sediment deposition (sedimentary) along the margins (Garabedian, 1992, p. 5). Quaternary-aged basalts are estimated to be 100 to 1,500 feet thick, with the majority of the area in the range of 100 to 500 feet thick (Whitehead, 1992, Plate 3). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and stream-produced sediments overlies the basalt. The plain is bounded on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. These rocks may also underlie the plain (Garabedian, 1992, p. 5). Granite of the Idaho batholith borders the plain to the northwest, along with sedimentary rocks and rocks changed by heat and/or pressure (metamorphic) (Cosgrove et al., 1999, p. 10). The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. A high degree of connectivity with the regional aquifer system is displayed over much of the river as it passes through the plain. However, some reaches are believed to be perched or separated from the main ground water by unsaturated rock, such as the Lewisville-to-Shelly reach. Rivers and streams entering the plain from the south are tributary to the Snake River. With the exception of the Big and Little Wood rivers, rivers entering from the north vanish into the basalts of the Snake River Plain aquifer that have a higher ability to transmit water.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) and Lindholm (1996, p.1) report that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Transmissivities obtained from test data in the upper 100 to 200 feet of the aquifer range from less than 0.1 square feet per second (ft^2/sec) to 56 ft^2/sec ($1.0x10^4$ to $4.8x10^6$ ft^2/day; Garabedian, 1992, p. 11, and Lindholm, 1996, p. 18). Lindholm (1996, p. 18) estimates aquifer thickness to range from 100 feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et al., 1999, p.15).

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 ft/mile and average 12 ft/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations. The estimated effective ratio of the rock's open space volume to its total volume range from 0.04 to more than 0.25 (Ackerman, 1995, p.1, and Lindholm, 1996, p.16).

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11) and locally from canal leakage. Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Aquifer discharge occurs primarily as seeps and springs on the northern wall of the Snake River canyon near Thousand Springs and near American Falls and Blackfoot (Garabedian, 1992, p.17). To a lesser degree, discharge also occurs through pumping and underflow.

The East Margin Area is among the most transmissive regions of the regional aquifer, therefore it has a higher ability to transmit water. A transmissivity of 21 ft^2/sec was used to represent the upper 200 feet of the regional aquifer in the East Margin Area in the three-dimensional USGS ground water flow model (Garabedian, 1992, Plate 6). The equivalent hydraulic conductivity or the rate at which water can move through permeable material is 9,072 feet per day (ft/day). This value is consistent with the range of hydraulic conductivity (9,500 to 11,708 ft/day) calculated using data from a constant-rate aquifer test conducted in 1981 (Jacobson, 1982, p. 23). This range was calculated by dividing the estimated transmissivity (228,000 to 281,000 ft^2/day) by the perforated interval of the observation well (24 feet). The geometric mean hydraulic conductivity based on analysis of specific capacity data from PWS wells (135 ft/day) is significantly lower.

A published water table map of the Upper Snake River Basin (IDWR, 1997, p. 9) indicates that the ground water flow direction in the ESRP aquifer in the East Margin Area is similar to that depicted at the regional scale (e.g., Garabedian, 1992, Plate 4).

Recharge from precipitation and surface water irrigation in the East Margin Area ranges from less than 10 to more than 20 inches per year (Garabedian, 1992, Plate 8). The low end of the range applies to the area near Blackfoot, while the high end applies to the area on the west side of American Falls Reservoir near Aberdeen.

Kjelstrom (1995, p. 13) reports an annual river loss of 280,000 acre-feet to the regional basalt aquifer for the 27.5-mile Lewisville-to-Shelley reach of the Snake River and 110,000 acre-feet for the 23.5-mile Shelley-to-Blackfoot reach. Annual river gains of 1,900,000 acre-feet for the 36.6-mile Blackfoot-to-Neeley reach are also estimated (Kjelstrom, 1995, p. 13). A seepage study conducted in the fall of 1980 on the Portneuf River showed a gain of about 560 cubic feet per second (ft^3/sec) (405,691 acre-feet) for the 13-mile Pocatello-to-American Falls Reservoir reach (Jacobson, 1982, p. 16). The average flow in the Blackfoot River near the city of Blackfoot is low at Station #13068500 (5.2 ft^3/sec; USGS, 2001) compared to the flow in the Snake River near the city of Blackfoot at Station #13069500 (2,900 ft^3/sec; USGS, 2001).

The Riverside Estates wells are completed, or assumed to be completed, in the regional basalt aquifer. Sources of ground water recharge are from surface water irrigation canals in the area and precipitation. The delineated source water assessment area for the Riverside Estates extends to the northeast approximately 25 miles terminating at the city of Idaho Falls (Appendix B). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases identified potential contaminant sources within the delineation areas. Some of these sources include dairies, underground storage tank (UST) sites, and gravel mines.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply source.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during August of 2002. The first phase involved identifying and documenting potential contaminant sources within Riverside Estates source water assessment area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Mr. Ed Jackson. At the time of the enhanced inventory, no additional potential contaminant sources were found within the delineated source water area. A map with well locations, delineated areas, and potential contaminant sources is provided with this report (Appendix B). Each potential contaminant source has been given a unique site number that references tabular information associated with the public water wells (Appendix A).

Section 3. Susceptibility Analyses

The susceptibility of the wells to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the wells, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative rankings that are derived for the wells is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix C contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility rankings.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors. These factors are surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the water producing zone of the wells. Slowly draining soils, such as silt and clay, typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface, and a water depth of more than 300 feet from the surface, protect the ground water from contamination.

Hydrologic sensitivity rated high for the wells (Table 1). This is based upon moderate to well drained regional soil classes, as defined by the National Resource Conservation Service (NRCS), which are located within the delineated area. Soils that have poor to moderate drainage characteristics have better filtration capabilities than faster draining soils. There was insufficient well log information to evaluate the vadose zone composition, the first depth to ground water, and whether there is at least 50 feet of cumulative thickness of low permeability material that could reduce the downward movement of contaminants. If well logs had been available the hydrologic sensitivity scores may have been lower.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system that can better protect groundwater. If the casing and annular seal both extend into a low permeability unit then the possibility of cross contamination from other aquifer layers is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capabilities. When information was adequate, a determination was made as to whether the casing and annular seals extend into low permeability units and whether current public water system construction standards are met.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems (PWS) to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead and if the well is designed to yield greater than 50 gallons per minute (gpm) a minimum of a 6-hour pump test is required. These standards are used to rate the system construction for the well by evaluating items such as condition of wellhead and surface seal, the thickness of the casing, etc. If all criteria are not met, the public water source does not meet the IDWR Well Construction Standards. In this case there was insufficient information available to determine if the wells met the criteria outlined in the IDWR Well Construction Standards.

The system construction scores rated high for the wells (Table 1). The 2002 sanitary survey (conducted by Southeastern District Health Department) states the wells do have vents, but that they are not screened. The purpose of the screen is to prevent small animals, insects, and debris from entering the well column. Well logs were not available to indicate if the well casings and annular seals extend into a low permeability geologic formation. Had well logs been available, the system construction score may have been lower. The well casing heights are adequate, and the wells are located outside of the 100-year floodplain, which may decrease the chance of contaminants being drawn into the drinking water sources by surface water flooding.

Potential Contaminant Source and Land Use

The potential contaminant sources and land use within the delineated zones of water contribution are assessed to determine the wells' susceptibility. When agriculture is the predominant land use in the area, this may increase the likelihood of agricultural wastewater infiltrating the ground water system. Agricultural land is counted as a source of leachable contaminants and points are assigned to this rating based on the percentage of agricultural land. The predominant land use within the delineated capture zones of Riverside Estates is irrigated agricultural cropland.

Other sources which may influence the delineated area include former underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, a wastewater land application (WLAP) site, dairies, and gravel quarries. Also found were sites regulated under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Additionally, Highway 26, Highway 39, Highway 20, and Interstate 15 are transportation corridors that cross the delineations. If an accidental spill occurred from these IOCs, VOCs, SOCs, or microbial contaminants could be added to the aquifer system. Other sources identified, which may contribute to the overall vulnerability of the water sources, were businesses and the Snake River within the delineated areas that may be considered potential contaminant sources. A complete list of the potential contaminant sources is provided with this assessment (Appendix A).

In terms of potential contaminant sources and land use susceptibility the wells rated high for IOCs (i.e., nitrates), VOCs (i.e. petroleum products), SOCs (i.e., atrazine), and moderate for microbial contaminants (i.e., fecal coliform).

Final Susceptibility Rating

A detection of an IOC above a drinking water standard MCL, or any detection of a VOC or SOC at the wellhead, will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and a large percentage of agricultural land contribute greatly to the overall ranking.

Table 1. Summary of Riverside Estates, Susceptibility Evaluation

Drinking Water Source	Susceptibility Scores									
	Hydrologic Sensitivity	Potential Contaminant Inventory and Land Use				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Wells	H	H	H	H	M	H	H*	H	H**	H*

H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H* = automatic high rating due to the presence of an animal pasture within 50 feet of the wells
H = automatic high rating due to presence of Di(2ethylhexyl)-phthalate**

Susceptibility Summary

In terms of total susceptibility, the wells automatically rated high for SOCs (due to the presence of Di(2ethylhexyl)-phthalate in the drinking water) and IOCs and microbials (due to an animal pasture within 50 feet of the wells.) The wells also rated high for VOC contaminants mostly due to the large number of petroleum rated potential contaminant sources within the wells capture zones.

Total coliform bacteria were detected in November 1993, June 1994, December 1996, October 1999, September 2000, and May 2002. The IOCs, arsenic, barium, fluoride, selenium, and nitrate have been detected in the drinking water, but at concentrations below the MCL for each chemical. Arsenic was detected, in August 1995, at a concentration of 0.007 mg/L. The SOC, Di(2ethylhexyl)-phthalate, was detected in December 1998 and March 1999 at concentrations of 0.0049 and 0.0032 mg/L, respectively. No VOC contaminants have been detected in the drinking water.

System construction was rated moderate, and hydrologic sensitivity was rated high primarily due to the lack of well log information. Had well log information been available these scores may have been reduced. Potential contaminant and land use scores were rated high for IOCs, VOCs, and SOCs and moderate for microbial contaminants.

Section 4. Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. Riverside Estates, drinking water protection activities should continue efforts aimed at keeping the distribution system free of microbial contaminants that may affect the drinking water quality. The water system should consider using disinfection practices to treat the water source if microbial contaminant issues arise. In addition continued efforts and monitoring should be undertaken to protect the water system from organic contaminants (i.e. Di(2ethylhexyl)-phthalate). Drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey. The wells should maintain sanitary standards regarding wellhead protection. Also, any new sources that could be considered potential contaminant sources in the wells’ zones of contribution should also be investigated and monitored to prevent future contamination. No potential contaminants (pesticides, paint, fuel, cleaning supplies, etc.) should be stored or applied within 50 feet of the wells. Land uses within most of the source water assessment area are outside the direct jurisdiction of Riverside Estates. Therefore partnerships with federal, state and local agencies, industrial and commercial groups should be established to ensure future land uses are protective of ground water quality. Educating the public about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods, proper lawn and garden care, and the importance of water conservation to name but a few. There are multiple resources available to help water systems implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Bingham County Soil and Water Conservation District. As major transportation corridors intersect the delineations (Interstate 15 and Highway 26), the Idaho Department of Transportation should be involved in protection efforts.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

DEQ Pocatello Regional Office	(208) 236-6160
DEQ State Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper (208) 343-7001 or email her at mlharper@idahoruralwater.com. Idaho Rural Water Association, for assistance with drinking water protection (formerly wellhead protection) strategies.

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POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLA – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRA – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

APPENDIX A

Riverside Estates
Potential Contaminants Source Index

Table 2. Potential Contaminants

Site #	Source Description[1]	TOT Zone (in years)[2]	Source Information	Potential Contaminants[3]
	Highway 26	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Highway 39	0-3	GIS Map	IOC, VOC, SOC, Microbials
1	UST Site-Farm; Closed	0-3	Database Search	VOC, SOC
2	UST Site-Farm; Closed	0-3	Database Search	VOC, SOC
3	Dairy	0-3	Database Search	IOC, Microbials
4	Dairy	0-3	Database Search	IOC, Microbials
6	Grain Elevators	0-3	Database Search	IOC, SOC, Microbials
7	Paint-Retail	0-3	Database Search	VOC
8	Agricultural Chemicals (Wholesale)	0-3	Database Search	IOC, SOC
10	SARA Site	0-3	Database Search	IOC, VOC, SOC
12	Wastewater Land Application Site	0-3	Database Search	IOC, Microbials
13	UST Site-Not Listed; Closed	3-6	Database Search	VOC, SOC
14	UST Site-Farm; Closed	3-6	Database Search	VOC, SOC
15	CERCLA Site	3-6	Database Search	IOC, VOC, SOC
16	Deep Injection Well	3-6	Database Search	IOC, VOC, SOC
17	Recharge Point	3-6	Database Search	IOC, VOC, SOC
18	Recharge Point	3-6	Database Search	IOC, VOC, SOC
19	Recharge Point	3-6	Database Search	IOC, VOC, SOC
20	Recharge Point	3-6	Database Search	IOC, VOC, SOC
21	Recharge Point	3-6	Database Search	IOC, VOC, SOC
22	Recharge Point	3-6	Database Search	IOC, VOC, SOC
23	Recharge Point	3-6	Database Search	IOC, VOC, SOC
24	Recharge Point	3-6	Database Search	IOC, VOC, SOC
25	Recharge Point	3-6	Database Search	IOC, VOC, SOC
	Interstate 15	3-10	GIS Map	IOC, VOC, SOC
	Snake River	3-10	GIS Map	IOC, VOC, SOC
	Highway 20	6-10	GIS Map	IOC, VOC, SOC
26	LUST Site-Cleanup Completed; Impact Unknown	6-10	Database Search	VOC, SOC
27	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
28	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
29	UST Site-Other; Closed	6-10	Database Search	VOC, SOC
30	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
31	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC
32	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
33	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC
34	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
35	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
36	UST Site-Utilities; Closed	6-10	Database Search	VOC, SOC
37	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
38	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
39	UST Site-Contractor; Open	6-10	Database Search	VOC, SOC
40	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
41	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
42	UST Site-Local Government; Closed	6-10	Database Search	VOC, SOC
43	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
44	UST Site-Truck/Transporter; Open	6-10	Database Search	VOC, SOC
45	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
46	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
47	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
48	UST Site-Local Government; Open	6-10	Database Search	VOC, SOC
49	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC

Site #	Source Description[1]	TOT Zone (in years)[2]	Source Information	Potential Contaminants[3]
50	UST Site-Utilities; Closed	6-10	Database Search	VOC, SOC
51	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
52	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
53	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
54	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
55	UST Site-Other; Closed	6-10	Database Search	VOC, SOC
56	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
57	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
58	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
59	UST Site-Truck/Transporter; Open	6-10	Database Search	VOC, SOC
60	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC
61	Dairy	6-10	Database Search	IOC
62	Dairy	6-10	Database Search	IOC
63	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
64	Hydraulic Equipment-Repairing	6-10	Database Search	VOC, SOC
65	Trucking	6-10	Database Search	VOC, SOC
66	Veterinarians	6-10	Database Search	IOC, VOC
67	Concrete Contractors	6-10	Database Search	IOC, VOC, SOC
68	Boat Dealers	6-10	Database Search	VOC, SOC
69	Steel Fabricators	6-10	Database Search	IOC, VOC
70	Oils-Fuel (Wholesale)	6-10	Database Search	VOC, SOC
71	Automobile Dealers-New Cars	6-10	Database Search	VOC, SOC
72	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
73	Tree Service	6-10	Database Search	VOC, SOC
74	Property Maintenance	6-10	Database Search	IOC, SOC
75	Grinding Wheels (Manufacturers)	6-10	Database Search	IOC, VOC
76	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
77	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
78	Automobile Lubrication Service	6-10	Database Search	IOC, VOC, SOC
79	Automobile Dealers-New Cars	6-10	Database Search	VOC, SOC
80	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
81	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
82	Concrete Contractors	6-10	Database Search	IOC, VOC, SOC
83	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
84	General Contractors	6-10	Database Search	IOC, VOC, SOC
85	Oils-Fuel (Wholesale)	6-10	Database Search	VOC, SOC
86	Controls Systems/Regulators	6-10	Database Search	IOC, VOC, SOC
87	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
88	Cleaners	6-10	Database Search	VOC
89	Gazebos	6-10	Database Search	IOC, VOC
90	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
91	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
92	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
93	Painters	6-10	Database Search	VOC
94	Electric Motors-Dlrs/Repairing (Wholesale)	6-10	Database Search	IOC, VOC
95	Hardware-Retail	6-10	Database Search	IOC, VOC, SOC
96	Movers	6-10	Database Search	VOC, SOC
97	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
98	Paving Contractors	6-10	Database Search	VOC, SOC
99	Oils-Fuel (Wholesale)	6-10	Database Search	VOC, SOC
100	Service Industry Machinery (Manufacturers)	6-10	Database Search	VOC, SOC

Site #	Source Description[1]	TOT Zone (in years)[2]	Source Information	Potential Contaminants[3]
101	Painters	6-10	Database Search	VOC
102	Trucking-Motor Freight	6-10	Database Search	VOC, SOC
103	Boat Dealers	6-10	Database Search	VOC, SOC
104	Automobile Customizing	6-10	Database Search	IOC, VOC, SOC
105	Tools-Electric (Wholesale)	6-10	Database Search	IOC, VOC
106	Snowmobiles	6-10	Database Search	VOC, SOC
107	General Contractors	6-10	Database Search	IOC, VOC, SOC
108	Gas Companies	6-10	Database Search	VOC, SOC
109	Demolition Contractors	6-10	Database Search	IOC, VOC, SOC
110	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC
111	Automobile Repairing & Service	6-10	Database Search	IOC, VOC, SOC
112	Home Builders	6-10	Database Search	IOC, VOC, SOC
113	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
114	Automobile Parts & Supplies-Retail	6-10	Database Search	VOC, SOC
115	Truck-Repairing & Service	6-10	Database Search	IOC, VOC, SOC
116	Movers	6-10	Database Search	VOC, SOC
117	House & Building Movers	6-10	Database Search	VOC, SOC
118	Wrecker Service	6-10	Database Search	IOC, VOC, SOC
119	Veterinarians	6-10	Database Search	IOC, VOC
120	Painters	6-10	Database Search	VOC
121	Trailers-Horse (Wholesale)	6-10	Database Search	VOC, SOC
122	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
123	X-Ray Laboratories-Industrial	6-10	Database Search	IOC, VOC, SOC
124	Photographers-Portrait	6-10	Database Search	VOC
125	General Contractors	6-10	Database Search	IOC, VOC, SOC
126	Building Contractors	6-10	Database Search	IOC, VOC, SOC
127	Automobile Parts & Supplies-Retail	6-10	Database Search	VOC, SOC
128	Carpet & Rug Cleaners	6-10	Database Search	VOC
129	Electric Equipment & Supplies-Wholesale	6-10	Database Search	IOC, VOC
130	Photographers-Portrait	6-10	Database Search	VOC
131	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
132	Laboratories-Dental	6-10	Database Search	IOC, VOC, SOC
133	Lawn Mowers	6-10	Database Search	VOC, SOC
134	Laboratories-Testing	6-10	Database Search	IOC, VOC, SOC
135	Dairies	6-10	Database Search	IOC
136	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
137	Hardware-Retail	6-10	Database Search	IOC, VOC, SOC
138	Plumbing Drain & Sewer Cleaning	6-10	Database Search	IOC, VOC
139	Truck Renting & Leasing	6-10	Database Search	VOC, SOC
140	Excavating Contractors	6-10	Database Search	IOC, VOC, SOC
141	Screen Printing	6-10	Database Search	VOC
142	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC
143	Veterinarians	6-10	Database Search	IOC, VOC
144	Car Washing & Polishing	6-10	Database Search	IOC, VOC, SOC
145	Automobile-Antique & Classic	6-10	Database Search	VOC, SOC
146	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
147	Cleaners	6-10	Database Search	VOC
148	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
149	Tree Service	6-10	Database Search	VOC, SOC
150	Recycling Centers (Wholesale)	6-10	Database Search	IOC, VOC, SOC
151	Pile Driving Equipment (Manufacturers)	6-10	Database Search	VOC, SOC

Site #	Source Description[1]	TOT Zone (in years)[2]	Source Information	Potential Contaminants[3]
152	Truck Renting & Leasing	6-10	Database Search	VOC, SOC
153	Excavating Contractors	6-10	Database Search	IOC, VOC, SOC
154	Well Drilling	6-10	Database Search	IOC, VOC, SOC
155	Machine Shops	6-10	Database Search	IOC, VOC, SOC
156	Recycling Centers (Wholesale)	6-10	Database Search	IOC, VOC, SOC
157	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
158	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
159	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
160	Metalworking Machinery (Manufacturers)	6-10	Database Search	IOC, VOC
161	Snowmobiles	6-10	Database Search	VOC, SOC
162	Tree Service	6-10	Database Search	VOC, SOC
163	Leather Gloves & Mittens (Manufacturers)	6-10	Database Search	VOC
164	Truck Stops	6-10	Database Search	VOC, SOC
165	Limousine Service	6-10	Database Search	VOC, SOC
166	Toxic Release Inventory	6-10	Database Search	VOC, SOC
167	RCRA Site	6-10	Database Search	SOC
168	RCRA Site	6-10	Database Search	IOC, VOC, SOC
169	RCRA Site	6-10	Database Search	IOC, VOC, SOC
170	RCRA Site	6-10	Database Search	VOC, SOC
171	RCRA Site	6-10	Database Search	IOC, VOC, SOC
172	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
173	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
174	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
175	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
176	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
177	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
178	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
179	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
180	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
181	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
182	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
183	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
184	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
185	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
186	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
187	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
188	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
189	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
190	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
191	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
192	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
193	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
194	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
195	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
196	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
197	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
198	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
199	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
200	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
201	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
202	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC

Site #	Source Description[1]	TOT Zone (in years)[2]	Source Information	Potential Contaminants[3]
203	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
204	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
205	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
206	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
207	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
208	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
209	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
210	SARA Site	6-10	Database Search	IOC, VOC, SOC
211	SARA Site	6-10	Database Search	IOC, VOC, SOC
212	SARA Site	6-10	Database Search	VOC, SOC
213	SARA Site	6-10	Database Search	VOC, SOC
214	SARA Site	6-10	Database Search	VOC, SOC
215	SARA Site	6-10	Database Search	IOC, VOC, SOC
216	SARA Site	6-10	Database Search	VOC, SOC
217	SARA Site	6-10	Database Search	IOC, VOC, SOC
218	SARA Site	6-10	Database Search	IOC, VOC, SOC
219	SARA Site	6-10	Database Search	IOC, VOC, SOC
220	Recharge Point	6-10	Database Search	IOC, VOC, SOC
221	Recharge Point	6-10	Database Search	IOC, VOC, SOC
222	Recharge Point	6-10	Database Search	IOC, VOC, SOC
223	Recharge Point	6-10	Database Search	IOC, VOC, SOC
224	Recharge Point	6-10	Database Search	IOC, VOC, SOC
225	Recharge Point	6-10	Database Search	IOC, VOC, SOC
226	Recharge Point	6-10	Database Search	IOC, VOC, SOC
227	Recharge Point	6-10	Database Search	IOC, VOC, SOC
228	Recharge Point	6-10	Database Search	IOC, VOC, SOC
229	Recharge Point	6-10	Database Search	IOC, VOC, SOC
230	Recharge Point	6-10	Database Search	IOC, VOC, SOC
231	Recharge Point	6-10	Database Search	IOC, VOC, SOC
232	Recharge Point	6-10	Database Search	IOC, VOC, SOC
233	Recharge Point	6-10	Database Search	IOC, VOC, SOC
234	Recharge Point	6-10	Database Search	IOC, VOC, SOC
235	Recharge Point	6-10	Database Search	IOC, VOC, SOC
236	Recharge Point	6-10	Database Search	IOC, VOC, SOC
237	Recharge Point	6-10	Database Search	IOC, VOC, SOC
238	Recharge Point	6-10	Database Search	IOC, VOC, SOC
244	Landfill-Closed	0-3	Database Search	IOC, VOC, SOC, Microbials
245	Landfill-Closed	0-3	Database Search	IOC, VOC, SOC, Microbials

Site # numbers are non-sequential

[1] SARA = Superfund Amendments and Reauthorization Act, RCRA = Resource Conservation Recovery Act, UST = underground storage tank, LUST = leaking underground storage tank, AST = aboveground storage tank, TRI = Toxic Release Inventory

[2]TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead,

[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

APPENDIX B

Riverside Estates
Delineation and Potential Contaminants Source Map

APPENDIX C

Riverside Estates
Susceptibility Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : RIVERSIDE ESTATES   NORTH WELL and SOUTH WELL
Public Water System Number 6060059   9/4/02 9:08:42 AM

1. System Construction		SCORE			
Drill Date	unknown				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	2002			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	5			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	YES	YES
	Total Potential Contaminant Source/Land Use Score - Zone 1A	4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	8	6	7	6
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	12	6	5	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
	Total Potential Contaminant Source / Land Use Score - Zone 1B	16	16	18	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	25 to 50% Irrigated Agricultural Land	1	1	1	
	Potential Contaminant Source / Land Use Score - Zone II	4	4	4	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
	Total Potential Contaminant Source / Land Use Score - Zone III	3	3	3	0
Cumulative Potential Contaminant / Land Use Score		27	25	29	14
4. Final Susceptibility Source Score		16	16	17	16
5. Final Well Ranking		High	High	High	High